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ABSTRACT

This paper proposes an explanation for the onset of autobiographical memory at about 4 years of age. It seems likely that normal middle-class 3-year-olds have not yet mastered language as a representational system. Research suggests that children learn the social and cultural forms of narrative memory in talk with others. It is hypothesized that children's experience with language as an external representational system will strongly influence its use as an internal representational system, and that, at the age of 4 years, children move into a new phase in which language becomes a medium of internal as well as external representation. Language represents what others know and is a way of comparing that representation with one's own representation of the same event. Thus, the onset of autobiographical memory is facilitated by, and possibly causally related to, the exchange of representations with others through language. (SH)

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EMERGENCE OF AUTOBIOGRAPHICAL MEMORY AT AGE 4[1]

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One of the most striking developments to occur around age 4 is the onset of autobiographical memory. Although known for over a century in terms of infantile amnesia, this development has been surprisingly neglected in developmental psychology until very recently. The reasons for this neglect are, I think, mainly two: First, change in the status of children's memory is not readily observable (which is also the case for most of the other changes documented in this symposium and elsewhere that recent research on representational change has uncovered). The memory change has been observed primarily from the perspective of retrospective remembering by adults. Second, it has been accounted for not in terms of memory development, but in terms of memory repression or reinterpretation from the psychodynamic point of view. In contrast, I think we can only understand the phenomenon of infantile amnesia if we consider it as a developmental phenomenon, involving a change in memory function.

The simple facts of the case, well documented over the past century are these: on average adults recall little or nothing from their life experiences prior to the age of 3 years. They usually recall a few memories from about the age of 4 years, which gradually increase in number up to about age 6 or 7, by which age most adults report that their life histories begin in earnest. The number of memories accessible to recall by adults can be mathematically modelled as a forgetting function, a simple function of time since the event; that is, the greater the number of years intervening between an event and its recall the fewer memories. This function reveals a linear decrease back to age 5, but the same function does not account for the years prior to age 5, which show a precipitous drop-off and then reach an approximate zero point at age 3 (Rubin 1986). Thus, for remembering events from early childhood some other explanation than a simple forgetting function is required. There have been two primary explanations offered in addition to the psychodynamic.

1. The first explanation is that memories were never there. According to this account, the availability of memories only from age 4 on reflects the fact that in infancy and very early childhood episodic memories do not exist. As suggested by Piaget,

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young children's memories are all jumbled up and are not retained. The extensive amount of research that has been reported in recent years documenting children's memory for events from the infancy and early childhood years allows us to reject the simplest form of this explanation. These memories range from recognition by 1-year-olds of location of objects (Nelson & Ross 1980) to recall of trips to Disney World experienced at 2 years and remembered at 4 years (Hamond & Fivush 1991). Thus recent work shows that lack of episodic memory in early childhood is not a viable explanation of the infantile amnesia phenomenon.

2. A second explanation that has been frequently offered for the unavailability of memories from very early childhood is that there is a qualitative shift in the structure of memories from schematic or generic to episodic or specific. This explanation has been put forward in different forms, beginning with Schachtel (1946).

Originally, on the basis of our early work on children's scripts, I thought this a likely explanation. It seems to accord with Tulving's (1972) distinction between episodic and semantic memory, suggesting that children at first were equipped only with a general semantic memory system, where all experiences were absorbed into a general model of the world, and none were retained as specific episodes. Unfortunately, there is nothing in the recent memory literature to support this hypothesis, either. Four and five year old children remember more details from an event than 3 year olds, but researchers have not documented any organizational or structural differences in the quality of the memories reported at younger and older ages that would account for the dramatic developmental shift to retention of memories over a life-span.

Two and three year olds often need a good deal of probing from adults to extract episodic memories that parents believe they must have, but they may also provide extensive accounts of episodes that they found memorable (Hudson 1990; Engel 1986; Nelson 1990). The discrepancy in the amount recalled between spontaneous and probed recall seems likely to result from a difference between what a two-year-old finds interesting, remarkable, memorable, and what an adult does. For example, in my studies of memory talk in pre-sleep monologues by my subject, Emily, at two years, I found that she recounted quite extensive and well-organized memories of ordinary everyday episodes from her life, but did not recount the truly novel (from her perspective) events that she took part in, such as airplane trips or her first day at nursery school.

Given that neither the quantitative and nor the qualitative explanation for the infantile amnesia phenomenon accords with recent empirical research, what then might be proposed to explain the onset of autobiographical memory at about age 4? It seems

important to make a distinction between episodic memories, which exist prior to age 3 and autobiographical memories, which begin to exist and persist only after the age of 3 years. In this perspective, autobiographical memories are a type of episodic memory, consisting of those memories that are retained and accessible to later recall, sometimes for a lifetime, and become part of one's life story.

Is the onset of autobiographical memory related to the other changes in cognitive functioning at age 4 documented in this syposium, and can it be accounted for in the same way? For example, is the onset of autobiographical memory the result of a shift to a new Knowing Level or to a new level of meta-representation? Certainly memory is a function of the representational system, and changes in that system should affect memory. Indeed, Perner has proposed precisely this result, that a shift to a new level of meta-representation makes possible a new function of memory, although he formulated this new function in Tulving's terms as a shift from generic to episodic memory. As I have just noted, however, this does not seem to accord with the bulk of the experimental and naturalistic data now available.

Moreover, in preliminary research at CUNY investigating this issue, we have found reliable relations between unprobed episodic recall of an experienced event and free recall of a categorized list by 4 year olds, but no relation between these memory measures and performance on a meta-representational task of the kind used by Perner and his colleagues. That is, increases in episodic recall in the preschool years do not seem to be accounted for by the representational changes indexed by theory of mind tasks. Of course, our research is only preliminary, but given the evidence from other recent studies of early memory, it seems likely that in general episodic memory will turn out to be independent of representational change at age 4. Autobiographical memory may, however, be a function of such change.

At this point I would like to consider what mechanisms explain the representational shifts that have been documented. Why at age 4 might the child move to a new representational level? In the developmental literature on representation there seems to be general adherence to a model of autochthonous development, that is, development that is solely a product of internal cognitive change. I would like to explore an alternative model in the context of the changes in autobiographical memory.

Why at age 4? Why not age 2, 3, or 5? I think this is an important question to ask, but we need to be sensitive also to variations in these ages; variation can sometimes tell us as much as general trends. The shift in autobiographical memory does not universally take place at the age of 4. There is considerable

variation in the age of onset, from about 3 years (but very rarely before that age) to age 8 or even later. I'm sure that all the researchers here find variation in performance on their tasks, with children varying in the age at which they achieve a given level. Of course, this could be due to maturation rate or individual differences in cognitive capacity.

Let me propose another possible causal factor. First, I note that the data on tasks such as those used in theory of mind research, or natural kind category research, or the Genevan research on functions, emerges from laboratories in which the subjects are for the most part Western European or mainstream American middle-class children of fairly homgeneous backgrounds. There is one characteristic of such children that we can be fairly sure of. By the age of four they have been talking for about two years and have mastered most of the basic grammar of their native language. Moreover, they have usually been exposed to talk with parents about their experiences, have listened to stories read from books, and often are enrolled in early childhood educational programs where much of the activity is verbally oriented. In other words, by four years language has entered their lives, and their representational systems, in a major way. I do not think it is at all unwarranted to believe that language makes a difference to the child's representations of the world, and to the child's ability to reflect on those representations. Representation <u>in</u> language may make it possible to reflect on representations in a new way, to enter into a meta-representational mode. Representing one's knowledge in language also makes it possible to exchange representations with others, and to compare one's own representations with those of other people.

I come back then to the question: Why 4 years? First, consider that all of the tasks we are discussing rest on evidence from verbal data. Consider also the difference between 3 year olds and 4 year olds on these tasks. It's not just that the 3 year olds are inept; they don't seem to have the same understanding of what is required of them in these tasks, and they don't seem to be able to verbalize enough to either clarify their understanding or convey their own conceptions clearly. However facile a 3 year old is at using language in everyday communication with parents and peers, it seems likely that "normal" standard middle-class three year olds have not yet mastered language <u>as a representational system</u>. It has not yet become a system within which they can represent and reflect on the complexities of their worlds, or take in complex representations of others, although they are able to convey some of their own representations of the world and their experiences in it through language.

One would expect to observe considerable variation in the age at which language itself becomes useful as a representational

system among children with different types of language experience - from different backgrounds, or cultures where language enters the child's life in different ways and to different extents.

There is in fact a great deal of recent evidence that children learn to talk about their memories in conversation with parents and other adults (Eisenberg, 1985; Engel, 1986; Hudson, 1990; Miller & Sperry 1988), suggesting that children learn the social and cultural forms of narrativising memory in talk with others. A recent study by Minda Tessler at CUNY (1991) has documented that the way that adults frame events, both during and after the event, influences not only what children remember from the event, but how they remember it. Following Bruner (1986) she distinguished between mothers who were narrativisers (talking about the when and why, making connections between the scene and other aspects of the child's knowledge) and those who were paradigmatic (talking about the what and where, emphasizing categorical knowledge, analyzing a scene into its parts). She found a very strong relation between the style of the mother's talk and the way in which children subsequently remembered their experience. She also found that the narrativising children of narrativising mothers recalled more from the experience. Thus parental talk helps children to know what to remember and in what format.

Now consider the variation in age of onset of autobiographical memory. There is evidence, mostly from the older literature testing age of earliest memories, relating onset to factors such as social class, gender and language facility. Earlier memories are positively related to higher social class, earlier language development, and being female.

Many developmental theories assume that advances in cognitive functioning that are independent of language thereafter may simply become reflected in language. But, as Vygotsky (1986) argued, language as a representational system of thinking (in his terms, inner speech) makes possible a more advanced level of thinking. This follows on a long line of historical figures, including notably G.H. Mead (1934). Moreover, it seems a reasonable hypothesis that children's experience with language as an external representational system will strongly influence its use as an internal representational system (Bakhtin 1981).

What I am arguing is that what may be observed in the various tasks that reveal significant changes at age 4 years may all reflect the fact that children have moved into a new phase where language has become a medium of internal as well as external representation. Language is no longer simply a way of telling other people what you think, know and remember; it has become a way of representing what others know, and of comparing that representation with one's own representation of the same alleged event. For most middle-class children this level of

representation in language is achieved at about 4 years, but the age of its achievement may vary considerably given different experiences with the use of language for representational purposes.

Thus I believe that the onset of autobiographical memory does reflect the same kind of meta-representational change that is observed in other tasks, for example, those used in theory of mind studies. It rests on the capacity to compare one's own representation of an event with another's, and to know that this representation of an experience is different from a previous one. What I am suggesting is that this move is at least facilitated by, and quite possibly causally related to, the exchange of representations with others through language. Language may have a number of possible influences on memory. The narrativizing function has already been alluded to. It may also reinstate an experience thus leading to its retention. And it may provide cues that are effective in reconstructing an experience. These different functions of language need to be explored further: they may be differentially effective under different conditions, for different children, and for different types of memory.

To explore these possibilities further we need more data from children who experience different kinds and degrees of language in use because of different social and cultural practices. This kind of comparative data will shed light on whether a particular level of language development is necessary to general representational change, whether particular kinds of language experience are necessary, whether these are facilitative, or whether these cognitive representational changes take place autochthonously, regardless of the child's social, cultural, or linguistic experience. As I have indicated in this brief discussion, however, I strongly doubt that that is the case.

Note: A more extensive discussion of these issues is presented in a paper titled "Toward an explanation of the development of autobiographical memory" prepared for the International Conference on Memory, University of Lancaster, July, 1991, to be published in the conference volume.

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